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THE SLEEP OF LIFE

"Transport Protocol for a COVID-19 patient"

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Introduction

The COVID-19 pandemic has changed the world in an unprecedented manner and in a very short span of time. Due to the highly infectious nature of the disease these patients are being treated in designated COVID-19 hospitals or are being isolated in quarantine centres. One of the key roles of health care workers is transporting COVID-19 positive patients to these designated hospitals or to quarantine centres. Hence, it is important for all HCWs to understand the right procedure of safe transport using ambulance, procedure of Donning and Doffing of Personal Protective Equipment (PPE) and subsequent disinfection of the Ambulance. The safety of the HCWs and prevention of disease transmission during transport is of paramount importance.

Need for transport

In view of COVID-19 being a highly infectious disease, patient should be moved only if absolutely necessary- e.g. shifting to a designated COVID hospital or for essential imaging investigations. This transport could be intra-hospital or inter-hospital**.** Inter hospital transfers should be planned and executed when patient is stable. Shifting unstable patients places both the patient and the health care workers at risk.

Personal Protective Equipment for HCWs

The staff accompanying the COVID-19 positive patient must wear the full complement of PPE, that is, N95 mask, gown, hood, 2 layers of gloves, goggles and or face shield and boot covers. The ambulance driver should wear a triple layer medical mask/ N95 mask and gloves. Maximum of one attendant should be allowed to come along with the patient if deemed necessary. The attendant should wear full PPE as advised.

Ambulance

Every hospital should earmark a separate ambulance for transport of COVID-19 patients. This should ideally not be used for Non-COVID-19 patients. The drivers' compartment should be separate from the patient compartment. Drivers compartment is considered clean, hence the HCWs who are accompanying the patient should not enter the drivers' compartment. The ventilation of the drivers' compartment should also be separate from the patient compartment. A folding stretcher trolley should be used for patient transport to minimize shifting between different stretchers during the shifting process. Shift the patient from ward/ICU bed to folding stretcher trolley, the same trolley goes into the ambulance, the trolley with patient is taken out of the Ambulance at the receiving COVID- 19 hospital and wheeled to the ward or ICU and shifted to the bed there.

Types of patients requiring transport

The patient requiring transport could be having a mild disease not requiring any oxygen support, moderate disease requiring oxygen support or he or she might be on ventilatory support. If the patient is ambulant, he or she should be asked to wear a N95 mask to reduce droplet spread. If the patient is on Oxygen therapy the same should be continued during transport. A patient on ventilatory support needs special care:

(a) Patient should be transported using a transport ventilator with adequate battery backup. The ventilator circuit should have viral filters – one between the Y-connector of the ventilator circuit and the endotracheal tube and another one at the expiratory valve of the transport ventilator. All connections must be secured carefully before transport. Ambu bag (manual resuscitator) should be kept as a contingency in case the ventilator battery runs out or the ventilator malfunctions. Avoid use of Bain's circuit as it will cause higher aerosolization of the virus due to higher flow of oxygen.

(b) Protective barrier, such as a transparent plastic sheet, should be used to cover the patients head end,and it should be disposed off once the patient is deboarded from the ambulance.

(c) Oxygen cylinder (1246 liters) should be FULL and checked by the doctors themselves before stating the process of transporting the patient. Oxygen cylinder key should be carried along with an additional full cylinder with a fitted bull nose apparatus. The amount of oxygen to be carried depends on the transportation time. It is always advisable to carry extra oxygen for unanticipated delays in transport.

(d) Prepared and ready to use emergency drugs should be carried in a closed container. The drugs that must be carried are Inj Adrenaline 1:10,000 (10ml syringe), Inj Atropine 0.6mg (5ml syringe) Inj Phenylephrine 50mcg/ml (10ml syringe) / Inj Mephentine 3mg/ml (10ml syringe) Inj Atracurium 5mg/ml (10 ml syringe), Inj Midazolam 1mg/ml (5 ml syringe).

(e) Emergency equipment like Laryngoscope and bougie, Endotracheal tubes of appropriate sizes, face masks, suction catheters, foot suction machine, suction tubing etc should also be carried during transport. (Annexure I)

(f) Infusions and lines should be minimized for ease of transport. Bolus dose of drugs can be given for sedatives and muscle relaxants. Inotrope infusions must be continued using an infusion pump with a good battery backup and a fully charged battery. Extra syringe of Inotrope infusions must be carried during transport if the transport times are long.

(g) Patients head end should be kept at an elevation of 30°-45° to prevent aspiration. Hands and legs should be neatly tucked into the bed sheet so as to prevent inadvertent injury during transport. Endotracheal tube and ventilator circuit connections must be checked after each change of position, as any disconnection could lead to extensive release of hazardous aerosol into the environment, exposing the HCWs to risk of infection.

(h) Monitoring of ECG, NIBP and SpO2 should be continued throughout the transport.

(j) On reaching the COVID-19 hospital the patient should be carefully shifted to the designated ICU bed or ward and the case details handed over to the receiving team. The case documents should not be taken inside the patient area but left outside in the duty doctor's room in a sealed packet.

(k) All disposable items used for transport must be discarded in the yellow biohazard bins.

HCW Personal Protection

(a) Minimum number of staff required to transport the patient safely should accompany the patient in order to reduce exposure.
(b) Hands should be decontaminated using soap and water for 20 seconds or min 70% alcohol-based sanitizer.
(c) PPE should be donned prior to transport (N95 mask, gown, gloves, boot covers, hood, goggles and face shield) (Annexure II)
(d) While in ambulance-(i) PPE should be worn throughout the journey including the way back. Transport team members should not sit in the driver's compartment even on the return journey.
(ii) Disposable linen should be used wherever possible.
(e) The designated COVID ICU should be informed about the ETA of the patient along with the clinical status and treatment details, to ensure team to be ready.
(f) Ensure that all disposables are safely discarded in the yellow BMW bins and the non-expendables and equipment are cleaned and disinfected and safely returned to the ICU/ward.
(g) Final Decontamination of the ambulance is carried out after returning to referral hospital and before reusing it.

By stander safety

(a) A pre-planned dedicated transport route should be used. This should not pass through any busy area to minimize exposure of bystanders.
(b) Security team should lead and ensure clearance of bystanders for the entire designated route ahead of transport team.
(c) Security team should wear surgical masks.

Contingency plan for medical emergencies enroute

(a) The need for intubation should be assessed prior to transport as intubation is best done under controlled settings inside the ICU.
(b) Cardiac arrest enroute: If there is a cardiac arrest, CPR should be offered to the patient only if it is not deemed futile. Hypoxic cardiac arrests do not respond well to CPR but expose the staff to risk of infection. The safety of HCWs remains paramount during the scenario of a cardiac arrest during transport.

Ambulance Decontamination

(a) The stretcher should be covered with a disposable impervious sheet. The stretcher is disinfected with 1% Sodium Hypochlorite spray at the end of transport along with the interior of the passenger compartment of the ambulance. After 30 min all surfaces should be wiped clean with sodium hypochlorite.
(b) Cleaning and disinfecting (full PPE as outlined above should be worn by the housekeepers while cleaning the ambulance).
(c) Surfaces (stretcher, chair, door handles, inside of the ambulance, floor of the ambulance etc.) should be cleaned with a freshly prepared 1% sodium hypochlorite solution or equivalent.
(d) Medical equipment should be cleaned as per hospital infection control protocol/ manufacturers recommendations.
(e) The exterior of the ambulance, door knobs and windows to be cleaned with 1% hypochlorite solution and left to dry for 30 minutes.

Debriefing by the team leader

The team leader should take a feedback from all team members at the end of patient transport. He or she should give their own inputs regarding what went wrong and what went right so that the next transport is done in an even better manner. If there is any suspicion of exposure of any HCW during the transport, it should be notified and appropriate action taken

Conclusion

Safe transport of COVID-19 patients is a challenge for the HCWs who must ensure not only patients' safety but also their own safety. A good amount of preparation before transport and use of SOPs will go a long way in ensuring safe transport.

KALEIDOSCOPE

A journal scan of Anaesthesia related articles

Surg Capt Rahul Yadav

Dexmedetomidine or propofol for sedation in mechanically ventilated adults with sepsis

Hughes CG, Mailloux PT, Devlin JW, et al
New England Journal of Medicine; February 2021
DOI: 10.1056/NEJMoa2024922

Targeting light sedation with dexmedetomidine or propofol for adults undergoing mechanical ventilation is suggested by current guidelines. These sedatives differ in terms of arousability, immunity, and inflammation. Their differential impact on results in mechanically ventilated adults with sepsis receiving light sedation was investigated in this multicenter, double-blind trial. Randomization of mechanically ventilated adults with sepsis was done to dexmedetomidine or propofol group, with doses adjusted by bedside nursing staff to attain target sedation aims decided by clinicians as per the Richmond Agitation–Sedation Scale. In terms of the number of days alive without delirium or coma, ventilator-free days, death at 90 days, or Telephone Interview for Cognitive Status questionnaire score at 6 months, there were no differences between dexmedetomidine and propofol. Both groups had similar safety endpoints. Overall, it was clear that outcomes did not differ between dexmedetomidine and propofol groups in this study population of mechanically ventilated adults with sepsis who were being treated with recommended light-sedation approaches.

Spontaneous vs mechanical ventilation during video-assisted thoracoscopic surgery for spontaneous pneumothorax: A randomized trial

Liu J, Liang H, Cui F, et al
The Journal of Thoracic and Cardiovascular Surgery; February 2021
DOI: 10.1016/j.jtcvs.2021.01.093

Given the reports of superior or equal efficacy of spontaneous ventilation video-assisted thoracic surgery (SV-VATS) vs mechanical ventilation VATS (MV-VATS) in terms of postoperative recovery, researchers went about investigating the perioperative safety of the SV-VATS blebectomy. They undertook a non-inferiority, randomized controlled trial (NCT03016858) including 335 patients with primary spontaneous pneumothorax (PSP) (aged between 16-50 years) undergoing the SV-VATS or the MV-VATS. The SV-VATS group was associated with significantly reduced total dosage of intraoperative opioid agents and shorter extubation time, post-anaesthesia care unit recovery time and food intake time, as well as reduced anaesthesia cost. The observations of this study overall support the non-inferiority of the SV-VATS to the MV-VATS in terms of complication rate and in selected patients undergoing blebectomy for PSP.

Inflammatory response, fluid balance and outcome in emergency high-risk abdominal surgery

Cihoric M, Kehlet H, Lauritsen ML, et al
Acta Anaesthesiologica Scandinavica; February 2021 DOI: 10.1111/aas.13792

Emergency high-risk abdominal surgery is most commonly conducted in the following disease etiologies: intestinal obstruction and perforated viscus. With the objective to ascertain improvement in patient assessment in the perioperative phase, the inflammatory response was examined in these two settings, focusing on potential difference in pathophysiology. The investigators reviewed the electronic medical records of 487 patients who underwent emergency abdominal surgery for intestinal obstruction and perforated viscus. Of these patients, 418 were included. Patients with perforated viscus (n = 203) exhibited significantly higher pre- and postoperative absolute CRP values than those with intestinal obstruction (n = 215). There was significant association between both pre- and postoperative CRP and adverse outcome, along with fluid balance and adverse outcome in patients with obstruction but not in those with perforation. Findings from this explorative study revealed that a high pre- and postoperative CRP and a high positive fluid balance were associated with worse outcome in patients with intestinal obstruction, but not in patients with perforated viscus.

Epidural vs general anesthesia for open pyloromyotomy in infants: A retrospective observational study

Opfermann P, Wiener C, Schmid W, et al
Paediatric Anaesthesia; February 2021 DOI: 10.1111/pan.14114

Researchers assessed thoracic epidural anaesthesia, vs general anaesthesia, for open infantile hypertrophic pyloric stenosis surgery, focusing on desaturation events (≤ 90% oxygen saturation) and absolute values of minimal oxygen saturation, minimal heart frequency, operating-room occupancy time, and duration of surgery in this retrospective analysis. There were 69 and 32 evaluable infants in the epidural and general anaesthesia groups, respectively. Cumulative higher minimal mean (SD) oxygen saturation values as well as lower minimal mean (SD) heart rate values over time were recorded in patients who received epidural anaesthesia. In this series, fewer desaturation events ≤ 90% occurred in relation to maintaining spontaneous breathing with minimal airway manipulation in patients undergoing open repair of hypertrophic pyloric stenosis under single-shot epidural anaesthesia as compared to general anaesthesia. Additionally, shorter turnover times in the operating room seemed to be conferred by this approach.

Effect of cognitive prehabilitation on the incidence of postoperative delirium among older adults undergoing major noncardiac surgery: The Neurobics randomized clinical trial

Humeidan ML, Reyes JPC, Mavarez-Martinez A, et al.
JAMA Surgery; February 2021 DOI: 10.1001/jamasurg.2020.4371
The authors conducted this prospective, single-blinded randomized clinical trial among older adults to ascertain whether cognitive prehabilitation decreases the incidence of postoperative delirium. This trial was carried out at the Ohio State University Wexner Medical Center in Columbus from March 2015 to August 2019. Patients 60 years of age and older having major, noncardiac, nonneurological surgery under general anaesthesia with an expected hospital stay of at least 72 hours were eligible for enrollment in the trial. Of the 699 patients invited to participate in the trial, 251 were ultimately included in the analysis. Electronic, tablet-based preoperative cognitive exercise targeting memory, speed, attention, flexibility, and problem-solving functions was the intervention employed in this study. Data revealed that the delirium rate among control participants was 23.0%. With intention-to-treat analysis, the delirium rate in the intervention group was 14.4%. Post hoc analysis removed 4 patients who did not attempt any cognitive exercise from the intervention group, yielding a delirium rate of 13.2%. In patients who were at least minimally compliant, the intervention lowered the risk of delirium. Further studies are needed for elaboration of the ideal activities, timing, and effective dosage for cognitive exercise-based interventions to reduce the risk and burden of postoperative delirium.

Increased sodium intake and decreased sodium excretion in ICU-acquired hypernatremia: A prospective cohort study

Mestrom EHJ, van der Stam JA, te Pas ME, et al
Journal of Critical Care; February 2021 DOI: 10.1016/j.jcrc.2021.02.002
This prospective study was undertaken to provide more in-depth insight into the development of early ICU-acquired hypernatremia in critically ill patients based on detailed, longitudinal, and quantitative data. Researchers conducted a comparative analysis using prospectively collected data of ICU patients. They included all patients requiring ICU admission for more than 48 hours between April and December 2018. For analysis, a total of 183 patients were enrolled, of whom 38% developed ICU-acquired hypernatremia. This study's findings demonstrated that the development of early ICU-acquired hypernatremia is preceded by increased sodium intake, decreased renal function, and reduced-sodium excretion.

Arrivals & Departures

Major General Shahbaz Hasnain hung up his uniform after completing 36 years of illustrious service on 31st January 2021. The family of Defence Anaesthesiologists wishes him and his family a very happy post retirement life.